



**(U//FOUO) Advanced Analysis Seminar: Computational Neurobiology**

FROM: [REDACTED]  
Office of Tradecraft for Analysis (S2113)  
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(U//FOUO) You are invited to the following presentation:

Topic: Mechanization of Intelligence -- Computational Neurobiology  
Speaker: Dr. Hecht-Nielsen  
Affiliation: Fair Isaac Corporation  
Date/Time: **April 6, 2004** [Tuesday] **1000-1200**  
Location: Ops2B Conference Ctr, 2B4118-3

(U//FOUO) The topic of this lecture is the description of the underlying mathematical basis of cognition. The main thrust of this talk will cover Confabulation (outlined in pages 2-11 in the document below).

(U) Here is a summary of confabulation quoted from the paper referenced below:

"The main research program of Artificial Intelligence has been to find some sort of reasoning process that can account for animal cognition. Confabulation, a symbolic prediction technique introduced here, is the antithesis of this program. Instead of trying to reason from assumed facts to conclusions, it uses a strange form of knowledge to rule out unreasonable outcomes; leaving a core set of not-unreasonable possibilities is called an expectation. Then, employing the same knowledge in a different way, it identifies the highest quality conclusions in the expectation. Unlike reasoning, which must employ highly refined and specific knowledge that is difficult and expensive to obtain, confabulation uses a type of knowledge (conditional probabilities between pairs of symbols) that is simple and easy to obtain in the required vast quantities. The recently discovered neuronal Marder/Turigiano/Hebb learning principle produces this kind of knowledge. Confabulation is proposed as the underlying mechanism of all vertebrate cognition."

(U) Dr. Hecht-Nielsen proposes that these discoveries will profoundly impact how artificial intelligence techniques are applied to a wide variety of problems.

(U) The Institute for Neural Computation's external Web site is: <http://inc2.ucsd.edu>

(U) Dr. Hecht-Nielsen's Paper can be accessed on the external Web at :  
[http://inc2.ucsd.edu/pdfs/UCSD\\_INC\\_TechReport0401.pdf](http://inc2.ucsd.edu/pdfs/UCSD_INC_TechReport0401.pdf)

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